

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 January 2004 (22.01.2004)

PCT

(10) International Publication Number
WO 2004/007241 A2

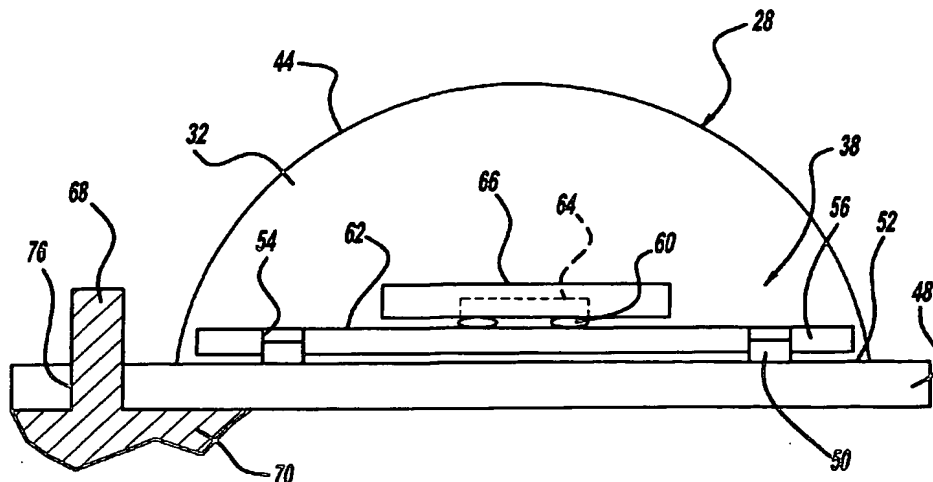
- (51) International Patent Classification⁷: **B60Q**
- (21) International Application Number:
PCT/US2003/022247
- (22) International Filing Date: 16 July 2003 (16.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/396,348 16 July 2002 (16.07.2002) US
- (71) Applicant (for all designated States except US):
SCHEFENACKER VISION SYSTEMS USA INC.
[US/US]; 1855 Busha Highway, Marysville, MI 48040 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **STEEN, Ronald, L.**
[US/US]; 7828 Brookpines Drive, Clarkston, MI 48348 (US). **LUCAS, Kyle, P.** [US/US]; 350 N. Rochester Road, Apt. 103, Clawson, MI 48017 (US).
- (74) Agent: **MILLER, John, A.**; Warn, Burgess & Hoffmann, P.C., P.O. Box 70098, Rochester Hills, MI 48307 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,

[Continued on next page]

(54) Title: WHITE LED HEADLIGHT



(57) Abstract: A vehicle headlight (12) that employs a plurality of LED units (38) that emit white light. Each LED unit (38) employs chip-on-board technology where LED semiconductor chips (64) are mounted directly to a submount substrate (56) using solder or stud bumps (60). An elongated lens (28) is molded over the LED unit (38) in contact with a base substrate (48). Light emitted from the semiconductor chip (64) is reflected and directed by the lens (28) to generate a beam of light (58). Some of the light emitted from the LED semiconductor chip (64) is redirected back to the submount substrate (56) to be reflected back into the lens (28) to increase the light intensity of the LED unit (38). Several of the elongated lens (28) and associated LED units (38) are optically glued to a single prism (24) that collects all of the light beams from all of the LED units (38).



MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

- *of inventorship (Rule 4.17(iv)) for US only*

Published:

- *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.